

WHAT IS CLAIMED:

1           1. A method for use in a network element of a packet-based network, the method  
2   comprising the steps of:

3 storing failure information associated with the packet-based network and usage  
4 information for a backup resource;

5       upon receipt of a new demand, determining if the backup resource is shareable as a  
6       function of the failure information and the usage information.

2. The method of claim 1 wherein the failure information is associated with links of the packet-based network, the backup resource is a backup path, the usage information is related to a bandwidth associated with the backup path, and the new demand has an associated bandwidth,  $d$ .

3. The method of claim 2 wherein the determining step includes the steps of:  
determining, from the failure information, if a simultaneous failure can occur on  
the backup path and a primary path; and

if no simultaneous failure can occur, updating usage information for the backup path as a function of the bandwidth  $d$  associated with the new demand.

4. The method of claim 3 wherein the updating step includes the step of determining, from the updated usage information, if the backup path can support the new demand such that if the new demand cannot be supported the new demand is rejected.

1           5. A network element for use in a packet-based network, the network element  
2   comprising:

3       a memory for storing failure information associated with the packet-based network  
4    and usage information for a backup resource; and

5           a processor, responsive to receipt of a new demand, for determining if the backup  
6   resource is shareable as a function of the failure information and the usage information.

1           6. The network element of claim 5 wherein the failure information is associated

2 with links of the packet-based network, the backup resource is a backup path, the usage  
3 information is related to a bandwidth associated with the backup path, and the new  
4 demand has an associated bandwidth,  $d$ .

1 7. The network element of claim 6 wherein the processor determines if the backup  
2 resource is shareable by determining, from the failure information, if a simultaneous failure  
3 can occur on the backup path and a primary path, and, if no simultaneous failure can  
4 occur, updating the usage information for the backup path as a function of the bandwidth  
5  $d$  associated with the new demand.

1 8. The network element of claim 7 wherein as part of the updating of the usage  
2 information, the processor determines, from the updated usage information, if the backup  
3 path can support the new demand such that if the new demand cannot be supported the  
4 processor causes the new demand to be rejected.

1 9. A network element for use in a packet-based network, the network element  
2 comprising:

3 a memory for storing failure information associated with a number of links of the  
4 packet-based network;

5 a communications interface for coupling to a link that is a part of a backup path;  
6 and

7 a processor, responsive to receipt of a new demand, for determining if the backup  
8 path is shareable with the new demand as a function of the failure information and usage  
9 information associated with the backup path.

1 10. The network element of claim 9 wherein the processor rejects the new demand  
2 if the backup path and a primary path associated with the new demand are determined to  
3 be capable of failing simultaneously from the failure information.

1 11. The network element of claim 9 wherein the processor rejects the new demand  
2 if the backup path cannot support the new demand based upon the usage information.